

30-015-39311

COG Operating LLC

New Mexico

Eddy County, New Mexico . .

Tex Mack 11 Federal #42

**SL: 2047' FNL 990'FEL BHL: 1660'FNL 980'FEL
Sec.11-T17S-R31E**

Survey: Survey #1

Standard Survey Report

06 December, 2011

Gyrodatta Survey Report

Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Eddy County, New Mexico
Project:	New Mexico	TVD Reference:	WELL @ 0.0ft (Original Well Elev)
Site:	Eddy County, New Mexico	MD Reference:	WELL @ 0.0ft (Original Well Elev)
Well:	Tex Mack 11 Federal #42	North Reference:	Grid
Wellbore:	SL: 2047' FNL 990'FEL BHL: 1660'FNL 980'FEL Sec.11-T17S-R31E	Survey Calculation Method:	Minimum Curvature
Design:	SL: 2047' FNL 990'FEL BHL: 1660'FNL 980'FEL Sec.11-T17S-R31E	Database:	EDM 5000.1 Single User Db

Project	New Mexico		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site		Eddy County, New Mexico			
Site Position:		Northing:	673,551.00 ft	Latitude:	32° 51' 2.453 N
From:	Map	Easting:	653,213.00 ft	Longitude:	103° 50' 3.952 W
Position Uncertainty:	0.0 ft	Slot Radius:	0 "	Grid Convergence:	0.27 °

Well	Tex Mack 11 Federal #42					
Well Position	+N/-S	0.0 ft	Northing:	673,551.00 ft	Latitude:	32° 51' 2.453 N
	+E/-W	0.0 ft	Easting:	653,213.00 ft	Longitude:	103° 50' 3.952 W
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	0.0 ft

Wellbore	SL: 2047' FNL 990'FEL BHL: 1660'FNL 980'FEL Sec.11-T17S-R31E				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	2011/11/18	7.69	60.73	48,985

Design	SL: 2047' FNL 990'FEL BHL: 1660'FNL 980'FEL Sec.11-T17S-R31E				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.0	0.0	0.0	1.16	

Survey Program	Date 2011/12/06				
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
100.0	7,020.0	Survey #1 (SL 2047' FNL 990'FEL BHL: 1 MWD		MWD	

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.41	266.82	100.0	0.0	-0.4	0.0	0.41	0.41	0.00
200.0	0.62	276.46	200.0	0.0	-1.3	0.0	0.23	0.21	9.64
300.0	0.53	294.25	300.0	0.3	-2.2	0.2	0.20	-0.09	17.79
400.0	0.59	302.06	400.0	0.7	-3.1	0.7	0.10	0.06	7.81
500.0	0.61	332.44	500.0	1.5	-3.8	1.4	0.32	0.02	30.38
600.0	0.36	20.19	600.0	2.2	-3.9	2.2	0.45	-0.25	47.75
700.0	0.19	288.88	700.0	2.6	-3.9	2.5	0.41	-0.17	-91.31
800.0	0.62	291.12	800.0	2.8	-4.6	2.8	0.43	0.43	2.24

Gyrodata Survey Report

Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Eddy County, New Mexico
Project:	New Mexico	TVD Reference:	WELL @ 0.0ft (Original Well Elev)
Site:	Eddy County, New Mexico	MD Reference:	WELL @ 0.0ft (Original Well Elev)
Well:	Tex Mack 11 Federal #42	North Reference:	Grid
Wellbore:	SL: 2047' FNL 990'FEL BHL 1660'FNL 980'FEL Sec.11-T17S-R31E	Survey Calculation Method:	Minimum Curvature
Design:	SL: 2047' FNL 990'FEL BHL 1660'FNL 980'FEL Sec.11-T17S-R31E	Database:	EDM 5000.1 Single User Db

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
900.0	0.10	188.83	900.0	3.0	-5.1	2.8	0.65	-0.52	-102.29	
1,000.0	0.29	4.57	1,000.0	3.1	-5.1	3.0	0.39	0.19	175.74	
1,100.0	0.18	352.31	1,100.0	3.5	-5.1	3.4	0.12	-0.11	-12.26	
1,200.0	0.07	342.01	1,200.0	3.7	-5.2	3.6	0.11	-0.11	-10.30	
1,300.0	0.15	82.34	1,300.0	3.8	-5.0	3.7	0.18	0.08	100.33	
1,400.0	0.15	131.90	1,400.0	3.7	-4.8	3.6	0.13	0.00	49.56	
1,500.0	0.27	125.85	1,500.0	3.5	-4.5	3.4	0.12	0.12	-6.05	
1,600.0	0.38	98.91	1,600.0	3.3	-4.0	3.2	0.19	0.11	-26.94	
1,700.0	0.48	103.40	1,700.0	3.2	-3.3	3.1	0.11	0.10	4.49	
1,800.0	1.52	98.98	1,799.9	2.9	-1.6	2.8	1.04	1.04	-4.42	
1,881.0	1.56	93.75	1,880.9	2.6	0.6	2.7	0.18	0.05	-6.46	
Gyro Tie-In 1881' MD										
2,012.0	1.60	95.80	2,011.9	2.3	4.2	2.4	0.05	0.03	1.56	
2,075.0	1.40	76.90	2,074.8	2.4	5.8	2.5	0.84	-0.32	-30.00	
2,137.0	1.40	43.30	2,136.8	3.1	7.1	3.3	1.31	0.00	-54.19	
2,200.0	1.80	10.50	2,199.8	4.7	7.8	4.8	1.56	0.63	-52.06	
2,262.0	2.60	8.50	2,261.8	7.0	8.2	7.2	1.30	1.29	-3.23	
2,324.0	3.50	7.90	2,323.7	10.3	8.6	10.5	1.45	1.45	-0.97	
2,419.0	4.50	2.60	2,418.4	16.9	9.2	17.1	1.12	1.05	-5.58	
2,512.0	4.80	0.50	2,511.1	24.4	9.4	24.6	0.37	0.32	-2.26	
2,606.0	4.90	358.40	2,604.8	32.4	9.3	32.6	0.22	0.11	-2.23	
2,700.0	5.20	358.30	2,698.4	40.6	9.1	40.8	0.32	0.32	-0.11	
2,794.0	4.40	357.80	2,792.1	48.5	8.8	48.7	0.85	-0.85	-0.53	
2,888.0	4.30	354.30	2,885.8	55.6	8.3	55.8	0.30	-0.11	-3.72	
2,983.0	4.40	351.50	2,980.6	62.8	7.5	62.9	0.25	0.11	-2.95	
3,077.0	4.50	359.70	3,074.3	70.0	6.9	70.1	0.68	0.11	8.72	
3,170.0	4.70	356.10	3,167.0	77.5	6.6	77.6	0.38	0.22	-3.87	
3,264.0	4.80	354.90	3,260.6	85.2	6.0	85.3	0.15	0.11	-1.28	
3,358.0	5.00	352.30	3,354.3	93.2	5.1	93.3	0.32	0.21	-2.77	
3,452.0	5.10	359.30	3,447.9	101.4	4.5	101.5	0.66	0.11	7.45	
3,521.0	4.70	359.30	3,516.7	107.3	4.4	107.4	0.58	-0.58	0.00	
3,616.0	4.80	358.40	3,611.4	115.2	4.3	115.3	0.13	0.11	-0.95	
3,678.0	4.90	356.30	3,673.1	120.4	4.0	120.5	0.33	0.16	-3.39	
3,772.0	4.80	3.20	3,766.8	128.4	4.0	128.4	0.63	-0.11	7.34	
3,866.0	5.10	2.70	3,860.5	136.5	4.4	136.5	0.32	0.32	-0.53	
3,960.0	4.90	2.70	3,954.1	144.6	4.8	144.7	0.21	-0.21	0.00	
4,054.0	4.50	2.10	4,047.8	152.3	5.1	152.4	0.43	-0.43	-0.64	
4,148.0	4.00	2.60	4,141.5	159.3	5.4	159.4	0.53	-0.53	0.53	
4,243.0	4.50	2.00	4,236.3	166.3	5.7	166.4	0.53	0.53	-0.63	
4,337.0	4.80	1.70	4,329.9	174.0	5.9	174.0	0.32	0.32	-0.32	
4,431.0	4.00	357.70	4,423.7	181.2	5.9	181.2	0.91	-0.85	-4.26	
4,525.0	4.20	359.80	4,517.4	187.9	5.8	188.0	0.27	0.21	2.23	

Gyrodata Survey Report

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Design:	SL: 2047' FNL 990'FEL BHL: 1660'FNL 980'FEL Sec.11-T17S-R31E	Database:	EDM 5000.1 Single User Db

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,619.0	4.70	1.00	4,611.1	195.2	5.8	195.2	0.54	0.53	1.28
4,713.0	4.00	358.70	4,704.9	202.3	5.8	202.4	0.77	-0.74	-2.45
4,807.0	4.30	359.80	4,798.6	209.1	5.7	209.2	0.33	0.32	1.17
4,902.0	4.60	359.10	4,893.3	216.5	5.7	216.5	0.32	0.32	-0.74
4,995.0	4.60	5.60	4,986.0	223.9	6.0	224.0	0.56	0.00	6.99
5,089.0	4.20	4.30	5,079.8	231.1	6.6	231.2	0.44	-0.43	-1.38
5,183.0	4.70	5.60	5,173.5	238.4	7.2	238.5	0.54	0.53	1.38
5,278.0	4.40	0.90	5,268.2	245.9	7.7	246.0	0.50	-0.32	-4.95
5,370.0	4.00	2.20	5,359.9	252.6	7.8	252.7	0.45	-0.43	1.41
5,464.0	4.70	1.70	5,453.7	259.7	8.1	259.8	0.75	0.74	-0.53
5,558.0	4.00	1.60	5,547.4	266.9	8.3	267.0	0.74	-0.74	-0.11
5,652.0	4.30	1.80	5,641.1	273.7	8.5	273.8	0.32	0.32	0.21
5,746.0	4.70	3.50	5,734.9	281.0	8.8	281.2	0.45	0.43	1.81
5,839.0	4.00	0.10	5,827.6	288.1	9.1	288.2	0.80	-0.75	-3.66
5,934.0	4.40	0.60	5,922.3	295.0	9.1	295.2	0.42	0.42	0.53
6,027.0	4.80	0.50	6,015.0	302.5	9.2	302.6	0.43	0.43	-0.11
6,122.0	4.60	0.30	6,109.7	310.3	9.2	310.4	0.21	-0.21	-0.21
6,216.0	4.20	358.20	6,203.4	317.5	9.2	317.6	0.46	-0.43	-2.23
6,293.0	4.40	358.50	6,280.2	323.3	9.0	323.4	0.26	0.26	0.39
6,403.0	4.30	358.40	6,389.9	331.6	8.8	331.7	0.09	-0.09	-0.09
6,497.0	4.30	356.10	6,483.6	338.6	8.4	338.7	0.18	0.00	-2.45
6,592.0	4.00	353.20	6,578.4	345.5	7.8	345.6	0.39	-0.32	-3.05
6,654.0	4.70	356.50	6,640.2	350.2	7.4	350.2	1.20	1.13	5.32
6,717.0	5.50	0.30	6,703.0	355.8	7.2	355.8	1.38	1.27	6.03
6,811.0	5.50	358.10	6,796.5	364.8	7.1	364.8	0.22	0.00	-2.34
6,905.0	5.30	358.30	6,890.1	373.6	6.8	373.7	0.21	-0.21	0.21
6,980.0	5.00	356.10	6,964.8	380.3	6.5	380.4	0.48	-0.40	-2.93
7,020.0	5.00	356.10	7,004.7	383.8	6.3	383.9	0.00	0.00	0.00

Projected Bottom Hole Location 7020' MD

Survey Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
1,881.0	1,880.9	2.6	0.6	Gyro Tie-In 1881' MD
7,020.0	7,004.7	383.8	6.3	Projected Bottom Hole Location 7020' MD

Checked By: _____ Approved By: _____ Date: _____



PO Box 1370
Artesia, NM 88211-1370
(575) 748-1288

December 8, 2011

COG, LLC
Fasken Center, Tower II
550 West Texas Ave, Suite 1300
Midland, TX 79701

RE: Tex Mack 11 Federal #42
2047' FNL & 990' FEL
Sec. 11, T17S, R31E
Eddy County, New Mexico

Dear Sir,

The attached is the Deviation Survey for the above captioned well.

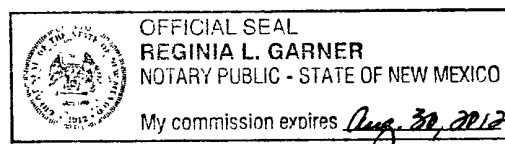
Very truly yours,


Eddie C. LaRue
Operations Manager

State of New Mexico }
County of Eddy }

The foregoing was acknowledged before me this 8th day of December, 2011.


Regina L. Garner
Notary Public



Pason DataHub Deviation Survey

Well Dossier 3376746 - Tex Mack 11 Federal #42

#	Date	Depth	Deviation	Direction
	11/25/2011	142	0.30	0.00
	11/26/2011	231	0.50	0.00
	11/26/2011	318	0.10	0.00
	11/26/2011	404	0.40	0.00
	11/26/2011	490	0.40	0.00
	11/26/2011	577	0.40	0.00
	11/26/2011	694	0.60	0.00
	11/28/2011	970	0.40	0.00
	11/28/2011	1409	0.40	0.00
	11/28/2011	1908	1.50	0.00
	11/29/2011	2012	1.60	95.80
	11/29/2011	2075	1.40	76.90
	11/29/2011	2137	1.40	43.30
	11/29/2011	2200	1.80	10.50
	11/29/2011	2262	2.60	8.50
	11/29/2011	2606	4.90	358.40
	11/29/2011	2700	5.20	358.30
	11/29/2011	2794	4.40	357.80
	11/29/2011	2888	4.30	354.30
	11/29/2011	2982	4.40	351.50
	11/29/2011	3076	4.50	359.70
	12/1/2011	3170	4.70	356.10
	12/1/2011	3264	4.80	354.90
	12/1/2011	3358	5.00	352.30
	12/1/2011	3452	5.10	359.30
	12/1/2011	3521	4.70	359.30
	12/1/2011	3678	4.90	356.30
	12/1/2011	3772	4.80	3.20
	12/1/2011	3866	5.10	2.70
	12/1/2011	3960	4.90	2.70
	12/1/2011	4054	4.50	2.10
	12/1/2011	4188	4.00	2.60
	12/2/2011	4243	4.50	2.00
	12/2/2011	4337	4.80	1.70
	12/2/2011	4463	4.00	357.70
	12/2/2011	4525	4.20	359.80
	12/2/2011	4619	4.70	1.00
	12/2/2011	4713	4.00	358.70
	12/2/2011	4827	4.30	359.80
	12/2/2011	4902	4.60	309.10
	12/2/2011	5183	4.70	5.60
	12/2/2011	5278	4.40	0.90
	12/2/2011	5370	4.00	2.20

12/2/2011	5464	4.70	1.70
12/2/2011	5558	4.00	1.60
12/3/2011	5652	4.30	1.80
12/3/2011	5746	4.70	3.50
12/3/2011	5840	4.00	0.10
12/3/2011	5934	4.40	0.60
12/3/2011	6028	4.80	0.50
12/3/2011	6122	4.60	0.30
12/3/2011	6216	4.20	358.20
12/4/2011	6550	4.30	358.40
12/5/2011	6497	4.30	356.10
12/5/2011	6592	4.00	353.20
12/5/2011	6655	4.70	356.50
12/5/2011	6717	5.50	0.30
12/5/2011	6811	5.50	358.10
12/5/2011	6980	5.00	356.10

EOF



Company: COG Operating
 Lease/Well: Tex Mack 11 Fed/42
 Location: Sec 11 T17s R31r
 Rig Name: Silver Oak #1
 State/County: New Mexico/Eddy
 Latitude: 30.85
 GRID North is 0.26 Degrees East of True North
 VS-Azi: 0.00 Degrees



Depth Reference : RKB = 12 Feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: tex mack 11 fed #42_ed.ut

Minimum Curvature Method

Report Date/Time: 12/13/2011 / 08:20

Vaughn Energy Services

Gardendale, Texas

432-563-5444

Surveyor: Seth Hardin

Tex Mack 11 Fed 42

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.41	266.82	100.00	-0.02	-0.36	0.36	266.82	0.41
200.00	0.62	278.46	200.00	0.04	-1.25	1.25	271.80	0.23
300.00	0.53	294.25	299.99	0.31	-2.20	2.22	277.98	0.18
400.00	0.59	302.06	399.99	0.77	-3.06	3.16	284.16	0.10
500.00	0.61	332.44	499.98	1.52	-3.74	4.04	292.05	0.31
600.00	0.36	20.19	599.98	2.28	-3.88	4.50	300.50	0.45
700.00	0.19	288.88	699.98	2.64	-3.92	4.73	303.89	0.41
800.00	0.62	291.12	799.97	2.88	-4.58	5.41	302.18	0.43
900.00	0.10	186.83	899.97	2.99	-5.09	5.91	300.43	0.65
1000.00	0.29	4.57	999.97	3.16	-5.08	5.98	301.86	0.39
1100.00	0.18	352.31	1099.97	3.57	-5.08	6.21	305.05	0.12
1200.00	0.07	342.01	1199.97	3.77	-5.12	6.36	306.39	0.11
1300.00	0.15	82.34	1299.97	3.85	-5.01	6.31	307.54	0.18
1400.00	0.15	131.90	1399.97	3.78	-4.78	6.09	308.35	0.13
1500.00	0.27	125.85	1499.97	3.56	-4.49	5.73	308.37	0.12
1600.00	0.38	98.91	1599.97	3.37	-3.98	5.21	310.26	0.18
1700.00	0.48	103.40	1699.96	3.22	-3.25	4.57	314.74	0.11
1800.00	1.52	98.98	1799.95	2.92	-1.54	3.30	332.23	1.05

Measured Depth FT	Incl Angle Deg	Strike Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1881.00	1.56	93.75	1880.92	2.68	0.62	2.75	13.10	0.18



Vaughn Energy Services
Gardendale, Texas
432-563-5444
Surveyor: Seth Hardin
Tex Mack 11 Fed 42

